

Moscardini figures U.S. Tool & Die spent 3,000 hours training workers last year, even paying an outside welding company to help it in the effort. "You figure every hour is worth \$60 to \$100," he says, "That's a big investment. You don't just let those people go."

EIGHT GREAT YEARS

Nor are many small to midsize manufacturers elsewhere in the nation rushing to cut back. Though some have had no choice but to lay off employees, even many of those whose business has softened are holding on to their workers, both out of loyalty to their communities and employees and out of fear that they will be left without much-needed talent when the economy strengthens. And, without public shareholders breathing down their necks demanding that they maximize returns, they have the flexibility to eschew layoffs in favor of longer-range business goals.

"They're not crying the blues because they had eight great years," says Dean Garritson of the National Association of Manufacturers, a trade group based in Washington. Most such businesses keep overhead low, and their owners can still afford to put "dollars into the company," he says. "They're less apt to let people go, and that creates a stabilizing force."

UPBEAT IN A SLOWDOWN

And a significant one. Those largely anonymous businesses account for about 9.8 million, or more than half, of the nation's manufacturing jobs. And their seeming resistance to layoffs helps explain why consumers, who are also employees, have remained relatively upbeat, despite the current slowdown.

Jerry Letendre owns Diamond Casting Corp. in Hollis, N.H., where he and his 50 employees pour molten aluminum into shapes for high-tech pumps. Last year, his profits dropped 50% and sales fell 30%. But rather than make big layoffs, he decided to hold off buying a new computerized milling machine and dug deeper into his own pockets to rebuild inventory and introduce new products. Twenty-five percent of his products were introduced in the past 10 months.

"During good times you conduct yourself so you can comfortably sustain not-so-good times like now," Mr. Letendre says. And, he adds, "I don't have Wall Street calling me asking, 'What have you done for me this week?'"

Here in southwest Pennsylvania, industrial stalwarts such as U.S. Steel Corp., Alcoa Inc. and Westinghouse Electric Corp. drove the economy, spawning thousands of smaller operations that were formed solely to supply and serve them. Many of those operations dried up over the decades as Westinghouse left town and steel's presence here shrank. The small manufacturers that have survived the shakeout have done so by keeping in step with the market and adopting new technologies in order to cut costs.

Extrude Hone is one of them. Mr. Rhoades's father started the business 35 years ago in the back of a tire shop. The company's purpose was to polish rough edges and holes in metal parts. Though that sounds like a minor adjustment, such fine-tuning can greatly enhance a product's performance. Having a smooth hole, rather than a jagged one, in a fuel-injection system, for example, even when the hole is only twice the diameter of a hair, can increase the flow of fuel by 20%. That means improved fuel economy and lower emissions. When it comes to heart valves and knee joints, the difference means better blood flow and less chance of

contamination. When it comes to aircraft engines, it means more power.

And if the customer doesn't want to do that kind of work itself, Extrude Hone will finish the parts for it in one of its several shops around the world, from Ireland to Japan. It also sells the proprietary putty used in its machines.

EXPLOITING ADVANTAGES

The fact that Extrude Hone is growing makes it an anomaly among the nation's machine-tool producers, whose overall sales have slumped since the late 1990s. In a recent speech before a business group in Birmingham, England, where the decline of heavy industry has paralleled that of Pittsburgh's, Mr. Rhoades shared his company's survival strategy with an audience eager to know how his manufacturing business had weathered the U.S. steel industry's diminished local presence.

The key, Mr. Rhoades said, was exploiting the advantages inherent in being a small manufacturer. Having relatively few employees, he said, helps his company to remain flexible and stay close to the factory floor and customers. Making things more economically, precisely or consistently isn't enough, he told the group. A small manufacturer, he said, has to make something distinctive and difficult for its customers to do without, and that requires investing in new designs and processes.

Mr. Rhoades spends about 15% of his company's sales on research and development, a surprisingly high percentage for a machine-tool maker. Many small and private companies are conservative and cautious about spending, in part because they don't have public investors to help them raise cash. That's where being private has its limitations, he says. The upside, he says, is that he is freer to focus on the long term, rather than on quarterly results.

Mr. Rhoades's newest and most promising technology, invented at the Massachusetts Institute of Technology, is a process for custom-making hundreds of different parts using a single machine. Rather than stamping a piece out of metal, the new process uses a computer scan of a part to create a copy of it, building it up layer by layer from a mixture of powdered metal and glue, which is then fused in a furnace.

Mr. Rhoades says the process eventually could be used by airlines or by auto shops that want to make replacement parts on site, rather than waiting for them to be delivered.

And that's why he's hiring. He needs metallurgists and people with computer and software skills, many of whom as recently as two years ago wouldn't have considered working for a machine-tool maker. "It just got to an unhealthy point where people were being drawn out of the work force and into dot-coms when they could make a bigger economic contribution" by working in mainstream manufacturing, he says.

Manufacturers create a local multiplier effect. They go through a lot of nuts, bolts, grease and paper clips, often relying on other local businesses and keeping their dollars in the community. They use the local delivery service, the local trucking company. Home sales here rose 41% in May, and while there's no direct correlation between robust real-estate sales and an uninterrupted flow of coated metal, it can't hurt either.

Last year, U.S. Tool & Die spent \$467,853 buying office supplies, gloves, cleaning materials, fasteners, bolts, grinding wheels, sanding belts and lifting devices such as slings from local suppliers. Steel to make its prod-

ucts comes from nearby Allegheny Ludlum Corp.

U.S. Tool & Die has survived by evolving. Formed about 50 years ago, it was engaged in the most basic aspect of manufacturing: making parts under contract for customers in the steel industry. In the mid-1970s, it began making racks to store spent nuclear fuel. It didn't change its business, remaining a contract manufacturer, but it changed markets completely. Now, it has contracts all over the world.

While U.S. Tool & Die's Mr. Moscardini credits the company's strong sales to dominating a particular niche, others seem to be doing well, too. "People I associated with in metal working and manufacturing, everyone seems healthy. We probably have 15 to 20 machine shops supporting us with subcontract work, and these guys are all busy."

John Ross, executive vice president of manufacturing at Kurt J. Lesker Co., says that customers in semiconductor and automotive businesses, which delayed spending, are now starting to buy again. "I get the impression we're not going to stay in this downturn for an extended period of time," he says.

Last year, Lesker, which has 200 employees and \$40 million a year in sales, expanded its work force by 15%. This year, Mr. Ross says, it plans to expand another 7%. He says Lesker's biggest problem is a shortage of skilled workers, such as welders and machinists.

A few years ago, Mr. Ross got together with some other area manufacturers to discuss the problem. With the help of Duquesne University in Pittsburgh and a local foundation, they developed a training program aimed at people who had planned to go to college and indicated an interest in a career but had ended up in dead-end jobs. So far, Lesker has hired about 15 graduates of the program, which is called Manufacturing 2000, including Dan McKenzie.

MORE EARNING POWER

Mr. McKenzie, 27, had just finished a stint with the Marine Corps and was working in a pizza shop. He saw the program's ad for free training and jumped on it. Now, he works for Lesker as a machinist and has taken some college courses toward an industrial-engineering degree. As a result, Mr. McKenzie, who made \$8.50 an hour delivering pizza, has seen his earning power increase substantially. The average annual wage in the manufacturing sector here is \$42,000. The sector, which employs about 15% of the region's workers, accounts for 20% of the region's wages, according to Barry Maciak of Duquesne's Institute for Economic Transformation.

Local companies paid \$1,250 for each Manufacturing 2000 graduate and considered it a bargain. "We don't have the resources to train and recruit that larger companies have," says Lesker's Mr. Ross. Once it gets people, the company is loath to lose them.

Moreover, the average age of machinists, welders and tool grinders is 43, and welders rarely wait until they are 65 to retire because their work is so physically demanding. So, the company has to think about the future.

But Lesker also feels a loyalty to its work force, a luxury many public companies can't afford. Kurt Lesker III, Lesker's president, remembers sales plummeting after the fall of the Berlin Wall dried up the company's defense-related business. "We went through several years of break even. We could have laid off. We decided to keep everyone because it had to get better," he says. "If it was a public company, I would have been fired."